# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/519,744 | 12/28/2004 | Monique Auvray | 5284-50PUS | 9219 |

| 27799          7590          02/09/2007 | EXAMINER |
|---|---|
| COHEN, PONTANI, LIEBERMAN & PAVANE<br>551 FIFTH AVENUE<br>SUITE 1210<br>NEW YORK, NY 10176 | SINGH, RAMNANDAN P |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2614 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 02/09/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 10/519,744 | AUVRAY ET AL. |
| | Examiner | Art Unit | |
| | Ramnandan Singh | 2614 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>Dec. 28, 2004 & Mar. 14, 2005</u>.

2a)☐ This action is **FINAL**.　　　2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-19, 22-41* is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4-5, 8-10, 12-13, 22, 27-29, 31, 33-34, 40-41* is/are rejected.

7)☒ Claim(s) *2-3, 6-7, 11, 14-19, 23-26, 30, 32, 35-39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☒ All　b)☐ Some * c)☐ None of:

　　　1.☒ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date <u>Dec. 28, 2004</u>.

4) ☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

# DETAILED ACTION

## *Priority*

1.    Acknowledgment is made of applicant's claim for foreign priority under 35

U.S.C. 119(a)-(d).  The certified copy in French has been filed on Dec. 28, 2004.

2.                        **Preliminary Amendment**

Preliminary amendment filed on Dec. 28, 2004 and Second Preliminary

amendment filed on March 14, 2005 are approved.

## *Claim Rejections - 35 USC § 102*

3.    The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.    Claims 1, 4-5, 8-10, 12-13, 40-41  are rejected under 35 U.S.C. 102(b) as being

anticipated by  Scalart et al [US 5,734,715].

Regarding claim 1, Scalart et al teach an echo processing device shown in Fig. 3

for attenuating echo components of a direct signal Xt in a return signal Yt, the device

comprising:

means (80) for calculating a receive gain Grt and a send gain Gtt;  first gain

application means for applying the receive gain Grt to the direct signal Xt

and producing an input signal Xt' emitted into an echo generator system (22) ; and

second gain application means for applying the send gain Gtt to an output

signal Yt from the echo generator system and producing the return signal Yt';

the device further comprising means for calculating a coupling variable µt

characteristic of the acoustic coupling between the direct signal Xt or the

input signal Xt' and the output signal Yt [Fig. 4, step 53], the gain calculation means

being adapted to calculate the receive gain Grt and the send gain Gtt on

the basis of the coupling variable [Figs. 1-4; col. 5, line 27 to col. 6, line29; col. 6, line

44 to col. 56; col. 11, line 4 to col. 12, line 47].

Regarding claim 10, Scalart et al teach an echo canceller 16 for attenuating in an

output signal echo components of an input signal Xt emitted into an echo generator

system [Figs. 2, 3], the device comprising:

a finite impulse response identification filter (18) whose response is

representative of the response of the echo generator system, receiving the input signal

Xt at its input and generating a filtering signal Zt [Fig. 2];

subtraction means (20) receiving at an input a signal from the echo generator

system, at least one component of which is a response of the echo generator

system to the input signal, and the filtering signal Zt, and adapted to

subtract the filtering signal Zt from the signal E2 and to produce the output

signal [Fig. 2];

means for adapting the coefficients of the identification filter (22)

as a function of an adaptation step (i.e. updating the filter coefficients) [Fig. 2]; and

means (78) for calculating the adaptation step $\mu t$, the adaptation step calculation

means comprising means for estimating the power $P1t$ of the input signal and the

power $P2t$ of the signal and means for calculating a first coupling variable

characteristic of the acoustic coupling between the input signal $Xt'$ and the

signal $Yt'$ from the echo generator system, the adaptation step $\mu t$ of

the identification filter being calculated as a function of the estimated

powers $P1t$, $P2t$ and as a function of the first coupling variable [Fig. 4, step 53; col. 6,

line 63 to col. 8, line 57; col. 12, lines 53-65]

Regarding claims 40 and 41, the limitations are shown above.

Regarding claims 4 and 5, Scalart et al further teach the echo processing

device, in which the coupling variable is obtained by calculating the correlation

between the direct signal $X1n$ or the input signal $X2n$ and the output signal $Y1n$; and in

which the calculation of the correlation between the direct signal $X1n$ or the input signal

$X2n$ and the output signal $Y1n$ is an envelope correlation calculation [Fig. 4, step 53;

col. 12, lines 10-43].

Regarding claims 12-13, the limitations are shown above.

Regarding claim 8, Scalart et al further teach the echo processing device, in

which the input signal X2n is emitted into the echo generator system by at least one

loudspeaker and the output signal Y1n is obtained from the echo generator system by

at least one microphone [Fig. 3].


Regarding claim 9, Scalart et al further teach the echo processing comprising

an echo canceller receiving at its input said input signal X2n emitted into the echo

generator system and the signal Y3n from the echo generator system, the echo

canceller comprising a finite impulse response identification filter (18) whose

response is representative of the response of the echo generator system, and

the identification filter being adapted to generate a filtering signal Sn and

comprising means for subtracting the filtering signal Sn from the signal Y3n to

produce an output signal Y1n that is received at the input of said send gain

application means [Fig. 2].


### Claim Rejections - 35 USC § 103

5.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.      Claims 22, 27-29, 31, 33-34 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Scalart et al [US 5,734,715] in view of Hirano [US 5,371,789].

Regarding claim 22, Scalart et al teach an echo processing device for a single

channel, as shown in Fig. 3, for attenuating echo components of a direct signal Xt in a

return signal Yt, the device comprising:

means (80) for calculating a receive gain Grt and a send gain Gtt; first gain

application means for applying the receive gain Grt to the direct signal Xt

and producing an input signal Xt' emitted into an echo generator system (22) ; and

second gain application means for applying the send gain Gtt to an output

signal Yt from the echo generator system and producing the return signal Yt';

the device further comprising means for calculating a coupling variable µt

characteristic of the acoustic coupling between the direct signal Xt or the

input signal Xt' and the output signal Yt [Fig. 4, step 53], the gain calculation means

being adapted to calculate the receive gain Grt and the send gain Gtt on

the basis of the coupling variable [Figs. 1-4; col. 5, line 27 to col. 6, line29; col. 6, line

44 to col. 56; col. 11, line 4 to col. 12, line 47].


Scalart et al do not teach an echo canceller device for multi-channel systems.


Hirano teaches an echo cancellation device having adaptive filters for a multi-

channel system {Figs. 1-4, 5A-6B; col. 2, line 46 to col. 5, line 57; claim 1].

At  the time of the invention, it would have been obvious to a person of ordinary

skill in the art   to combine the teachings of Hirano with Scalart et al in order to  enable

one to use teleconferencing systems having multi-channel echo canceller [Hirano; col.

1, lines 7-11].


Regarding claim 31, Scalart et al teach an echo canceller 16 for attenuating in an

output signal echo components of an input signal Xt emitted into an echo generator

system in a single-channel system  [Figs. 2, 3], the device comprising:

a finite impulse response identification filter (18) whose response is

representative of the response of the echo generator system, receiving the input signal

Xt at its input and generating a filtering signal Zt [Fig. 2];

subtraction means (20) receiving at an input a signal from the echo generator

system, at least one component of which is a response of the echo generator

system to the input signal, and the filtering signal Zt, and adapted to

subtract the filtering signal Zt  from the signal E2 and to produce the output

signal [Fig. 2];

means for adapting the coefficients of the identification filter (22)

as a function of an adaptation step (i.e. updating the filter coefficients) [Fig. 2];  and

means (78) for calculating the adaptation step µt, the adaptation step calculation

means comprising means for estimating the power P1t of the input signal  and the

power P2t of the signal and means for calculating a first coupling variable

characteristic of the acoustic coupling between the input signal Xt' and the

signal Yt' from the echo generator system, the adaptation step μt of

the identification filter being calculated as a function of the estimated

powers P1t, P2t and as a function of the first coupling variable [Fig. 4, step 53; col. 6,

line 63 to col. 8, line 57; col. 12, lines 53-65]


Scalart et al do not teach an echo canceller for multi-channel systems.


Hirano teaches an echo cancellation having adaptive filters for a multi-channel

system [Figs. 1-4, 5A-6B; col. 2, line 46 to col. 5, line 57; claim 1].


At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to combine the teachings of Hirano with Scalart et al in order to enable

one to use teleconferencing systems having multi-channel echo canceller [Hirano; col.

1, lines 7-11].


Regarding claim 27, although Scalart et al teach using a variable gain (66) in the

receive channel [Fig. 3], it would have been obvious to a person of ordinary skill in the

art to use any value of the receive gain between 0 and 1 including 1 to match the

operation requirement subject to circuit, system and design constraints.


Regarding claims 28 and 29, the combination of Scalart et al and Hirano further

teach the echo processing device, in which each coupling variable is obtained by

calculating the correlation between the corresponding output signal Y1n(j) and the

corresponding input signal X2n(i) [Scalart et al;  and in which the calculation of the

correlation between an output signal Y1n(j) and an input signal X2n(i) is an envelope

correlation calculation   [Scalart et al; Fig. 4, step 53; col. 12, lines 10-43].


Regarding claims 33 and 34, the limitations are shown above.


### *Allowable Subject Matter*

7.      Claims 2-3, 6-7, 11, 14-15, 16-19, 23-26, 30, 32, 35-36, 37-39 are objected to as

being dependent upon a rejected base claim, but would be allowable if rewritten in

independent form including all of the limitations of the base claim and any intervening

claims.


The following is a statement of reasons for the indication of allowable subject

matter:

Claim 2  defines a variable G determined as a function of the estimated

power of the direct signal or the input signal and the estimated power of the

output signal, and as a function of the coupling variable COR according with the

following equation:

$G = P_{2n} / (P_{2n} + COR. P_{1n})$    where  $P_{1n}$ and $P_{2n}$ are respectively an estimate at

the time concerned of the power of the direct signal X1n or the input signal X2n and the

power of the output signal Y1n.

Since claim 2 defines the variable G using a unique relationship, claim 2 is objected to. Claim 3 is dependent from claim 2 is also objected to.

Similarly, for the above reasons, claims 6-7, 11, 14-15, 23-26, 30, 32 and 35-36 are objected to.

Claim 16 claims calculating the adaptation step of the adaptive filter as a function of the second coupling variable COR. Therefore, claim 16 is objected to. claims 17-19 being dependent from claim 16 are also objected to.

Similarly, for the above reasons, claims 37-39 are also objected to.

### *Conclusion*

8.      The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(i) Li [US 5,646,990] teaches an efficient speakerphone ati-howling system using variable gains in a receive and transmit channels [Fig. 2; Abstract]; and

(ii) Le Damany et al [US 5,970,137] teach a method for loudspeaker gain correction [Figs. 1-2; Abstract].

9.     Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (571) 272-7529.  The examiner can normally be reached on M-TH (8:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on 571-272-7547.  The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.  Status information for published applications may be obtained from either Private PAIR or Public PAIR.  Status information for unpublished applications is available through Private PAIR only.  For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ramnandan  Singh
Examiner
Art Unit 2614